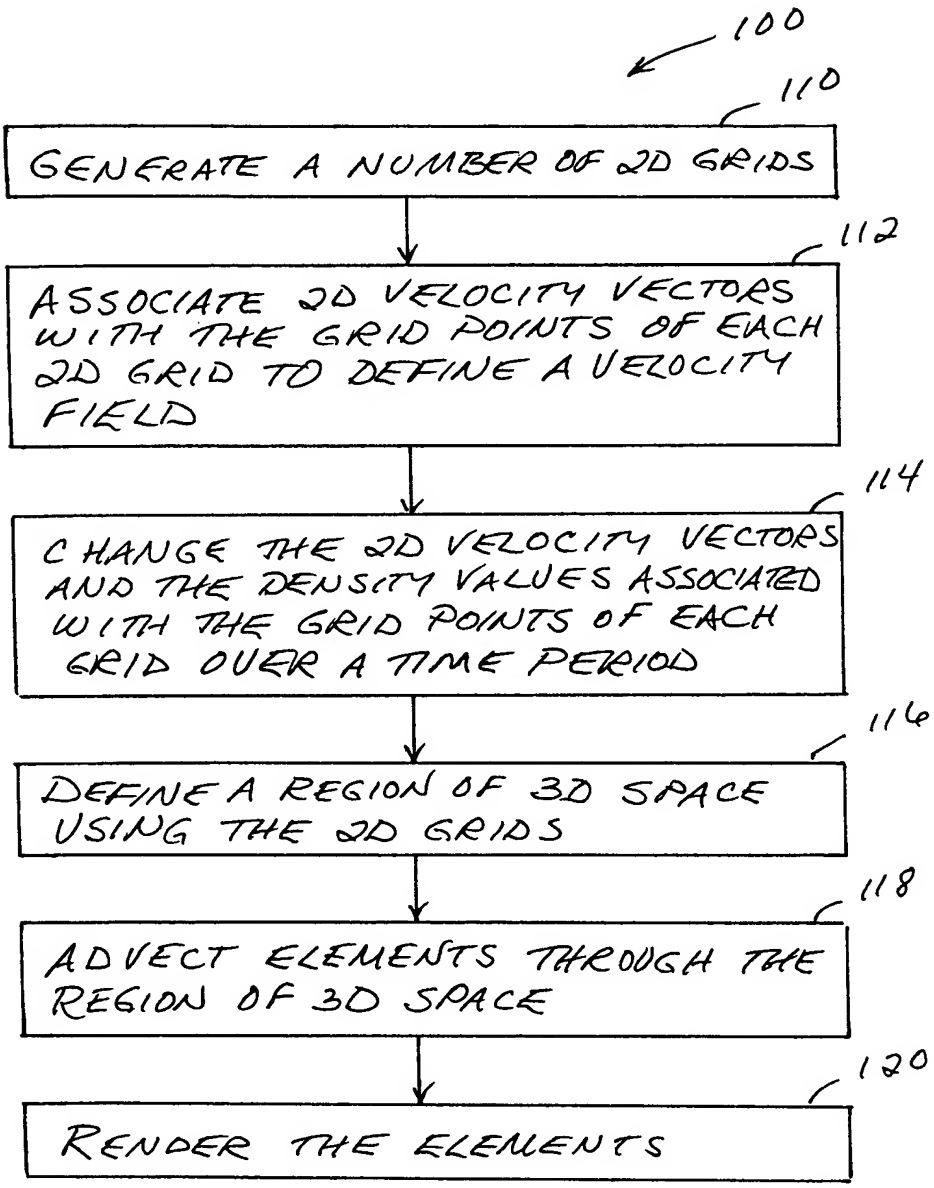
100
110
GENERATE A NUMBER OF 2D GRIDS
112
ASSOCIATE 2D VELOCITY VECTORS WITH THE GRID POINTS OF EACH 2D GRID TO DEFINE A VELOCITY FIELD
114
CHANGE THE 2D VELOCITY VECTORS AND THE DENSITY VALUES ASSOCIATED WITH THE GRID POINTS OF EACH GRID OVER A TIME PERIOD
116
DEFINE A REGION OF 3D SPACE USING THE 2D GRIDS
118
ADVECT ELEMENTS THROUGH THE REGION OF 3D SPACE
120
RENDER THE ELEMENTS

FIG. 1

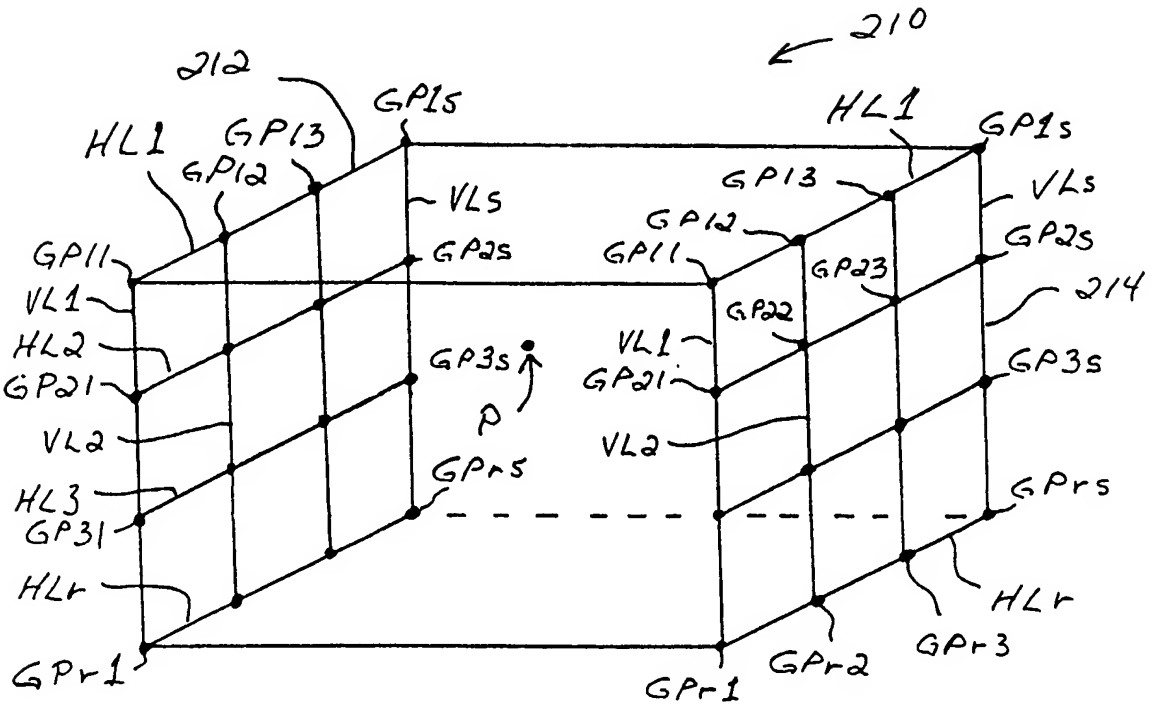
210
212
GP1s
HL1
GP13
GP12
VLs
GP2s
GP11
VL1
HL2
GP21
GP3s
P
VL2
GPrs
HL3
GP31
HLr
GPr1
HL1
GP1s
GP13
VLs
GP12
GP2s
GP11
GP23
214
GP22
VL1
GP21
GP3s
VL2
GPrs
HLr
GPr3
GPr2
GPr1

FIG. 2A

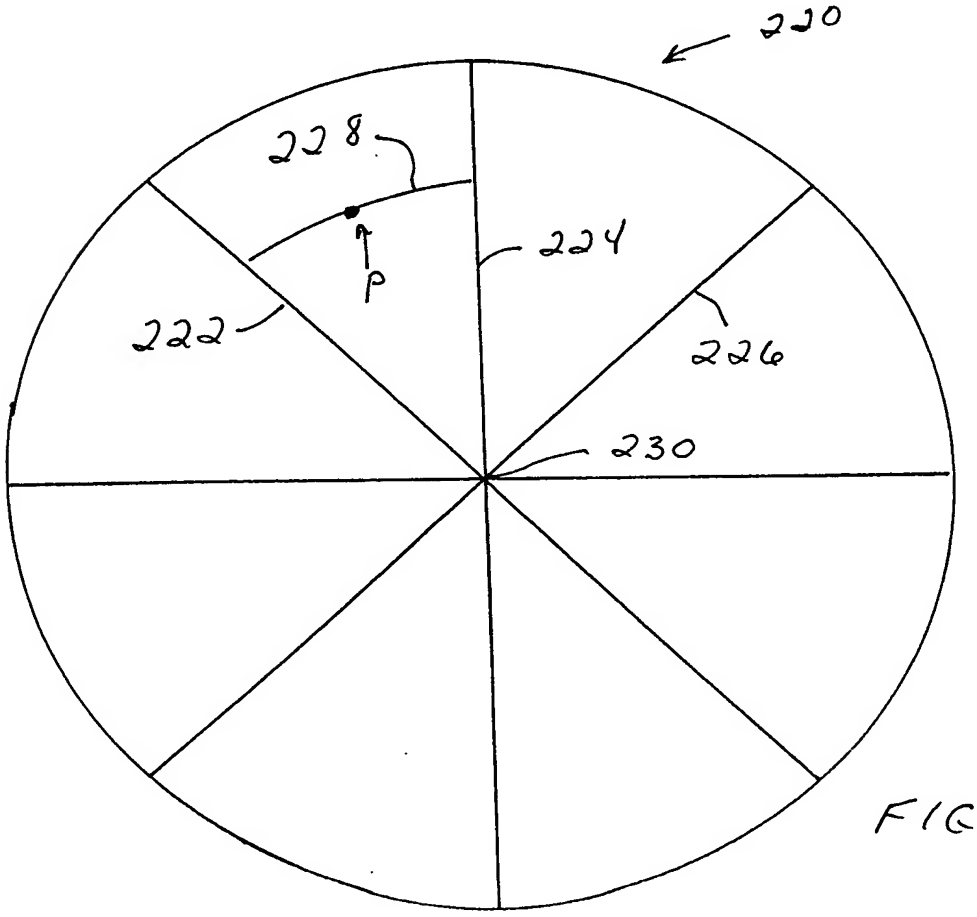
220
228
P
224
222
226
230

FIG. 2B

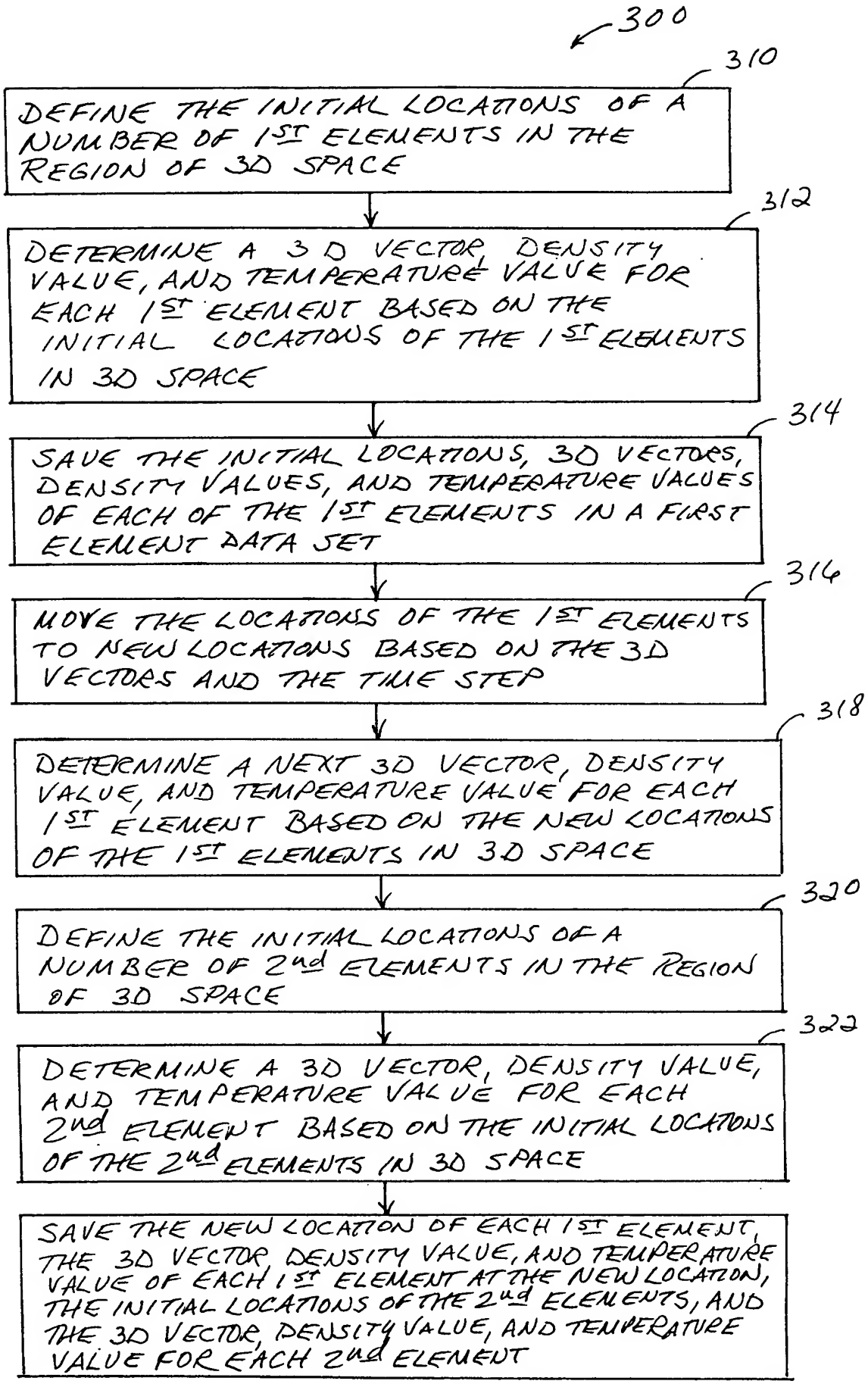
300
310
DEFINE THE INITIAL LOCATIONS OF A NUMBER OF 1ST ELEMENTS IN THE REGION OF 3D SPACE
312
DETERMINE A 3D VECTOR, DENSITY VALUE, AND TEMPERATURE VALUE FOR EACH 1ST ELEMENT BASED ON THE INITIAL LOCATIONS OF THE 1ST ELEMENTS IN 3D SPACE
314
SAVE THE INITIAL LOCATIONS, 3D VECTORS, DENSITY VALUES, AND TEMPERATURE VALUES OF EACH OF THE 1ST ELEMENTS IN A FIRST ELEMENT DATA SET
316
MOVE THE LOCATIONS OF THE 1ST ELEMENTS TO NEW LOCATIONS BASED ON THE 3D VECTORS AND THE TIME STEP
318
DETERMINE A NEXT 3D VECTOR, DENSITY VALUE, AND TEMPERATURE VALUE FOR EACH 1ST ELEMENT BASED ON THE NEW LOCATIONS OF THE 1ST ELEMENTS IN 3D SPACE
320
DEFINE THE INITIAL LOCATIONS OF A NUMBER OF 2nd ELEMENTS IN THE REGION OF 3D SPACE
322
DETERMINE A 3D VECTOR, DENSITY VALUE, AND TEMPERATURE VALUE FOR EACH 2nd ELEMENT BASED ON THE INITIAL LOCATIONS OF THE 2nd ELEMENTS IN 3D SPACE
SAVE THE NEW LOCATION OF EACH 1ST ELEMENT, THE 3D VECTOR, DENSITY VALUE, AND TEMPERATURE VALUE OF EACH 1ST ELEMENT AT THE NEW LOCATION, THE INITIAL LOCATIONS OF THE 2nd ELEMENTS, AND THE 3D VECTOR, DENSITY VALUE, AND TEMPERATURE VALUE FOR EACH 2nd ELEMENT

FIG. 3

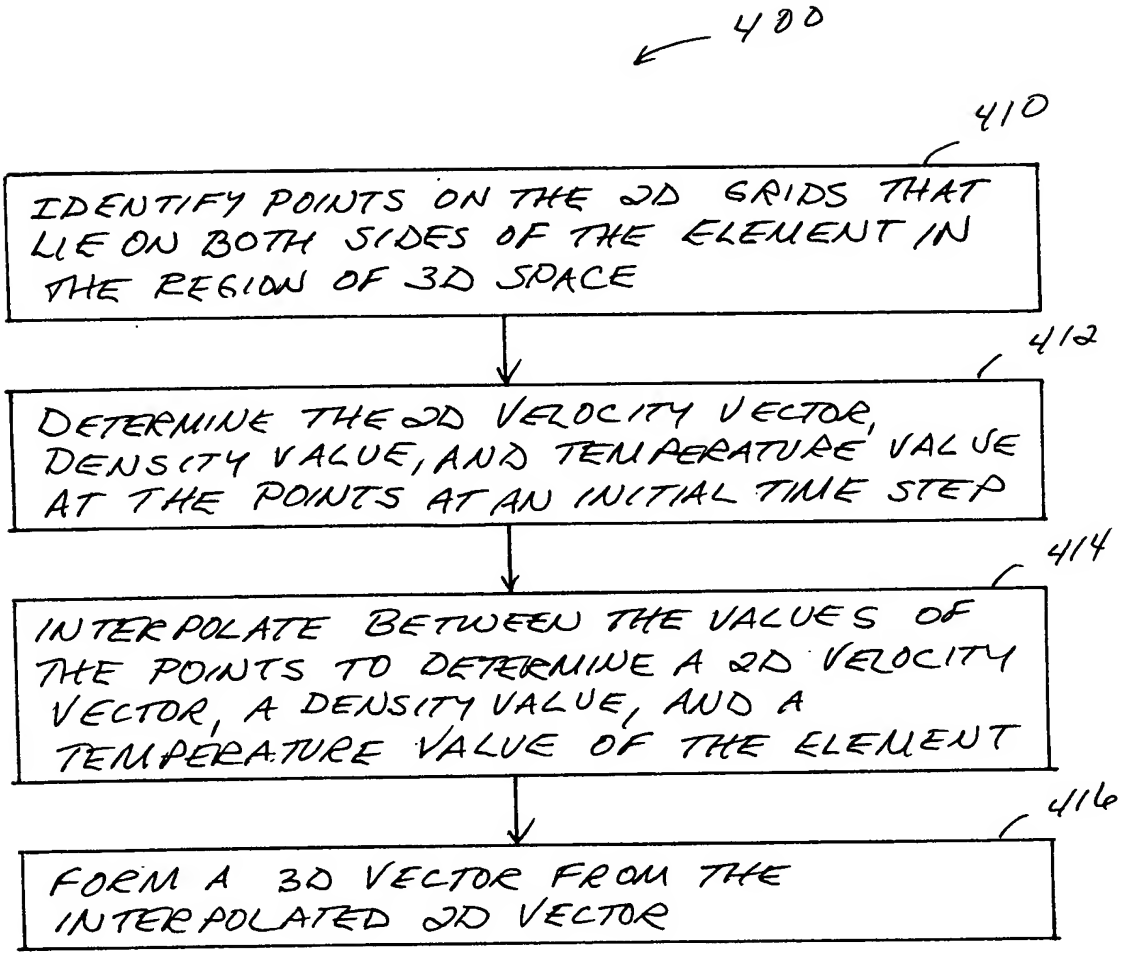
400
410
IDENTIFY POINTS ON THE 2D GRIDS THAT LIE ON BOTH SIDES OF THE ELEMENT IN THE REGION OF 3D SPACE
412
DETERMINE THE 2D VELOCITY VECTOR, DENSITY VALUE, AND TEMPERATURE VALUE AT THE POINTS AT AN INITIAL TIME STEP
414
INTERPOLATE BETWEEN THE VALUES OF THE POINTS TO DETERMINE A 2D VELOCITY VECTOR, A DENSITY VALUE, AND A TEMPERATURE VALUE OF THE ELEMENT
416
FORM A 3D VECTOR FROM THE INTERPOLATED 2D VECTOR

FIG. 4

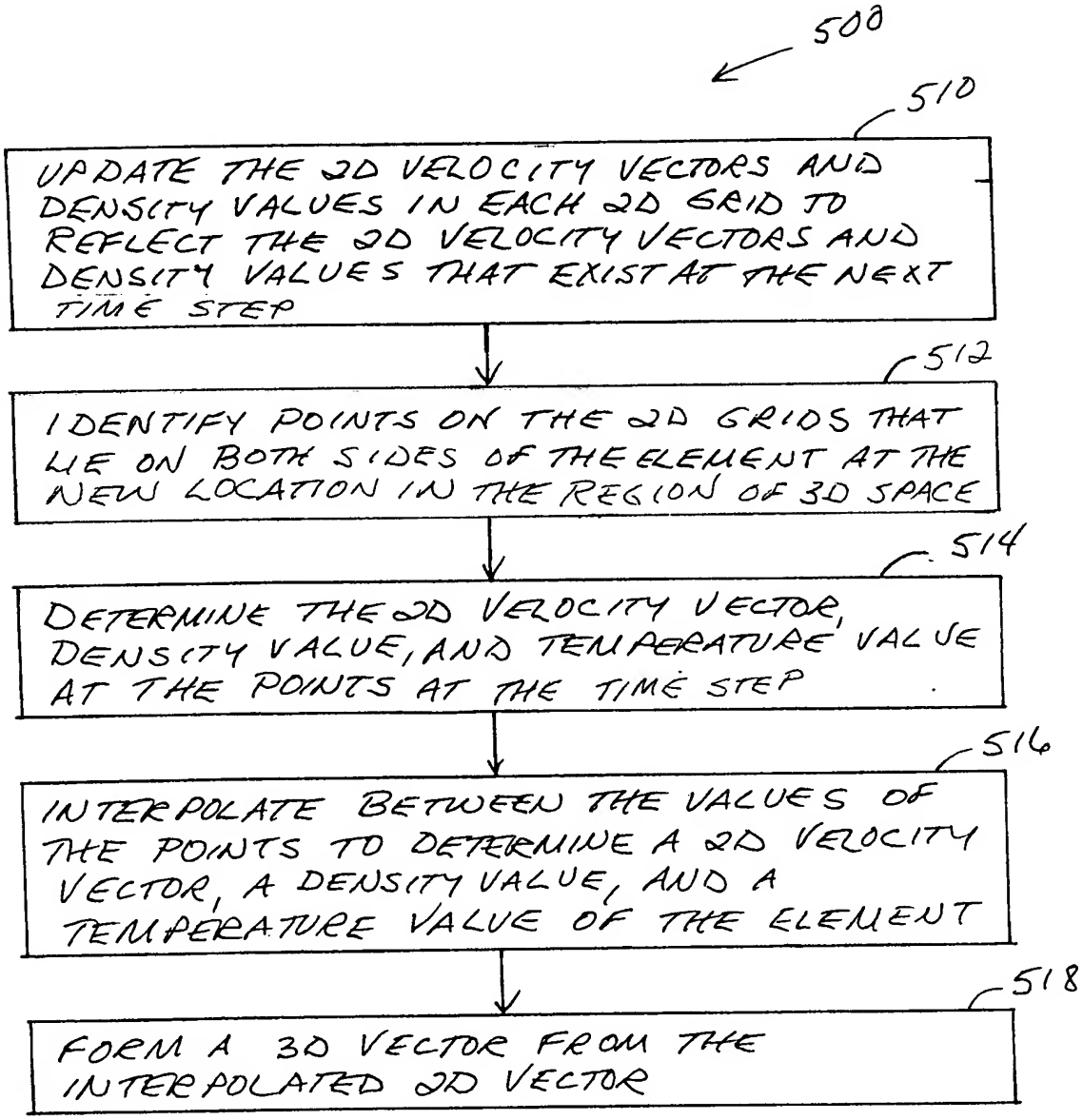
500
510
UPDATE THE 2D VELOCITY VECTORS AND DENSITY VALUES IN EACH 2D GRID TO REFLECT THE 2D VELOCITY VECTORS AND DENSITY VALUES THAT EXIST AT THE NEXT TIME STEP
512
IDENTIFY POINTS ON THE 2D GRIDS THAT LIE ON BOTH SIDES OF THE ELEMENT AT THE NEW LOCATION IN THE REGION OF 3D SPACE
514
DETERMINE THE 2D VELOCITY VECTOR, DENSITY VALUE, AND TEMPERATURE VALUE AT THE POINTS AT THE TIME STEP
516
INTERPOLATE BETWEEN THE VALUES OF THE POINTS TO DETERMINE A 2D VELOCITY VECTOR, A DENSITY VALUE, AND A TEMPERATURE VALUE OF THE ELEMENT
518
FORM A 3D VECTOR FROM THE INTERPOLATED 2D VECTOR

FIG. 5

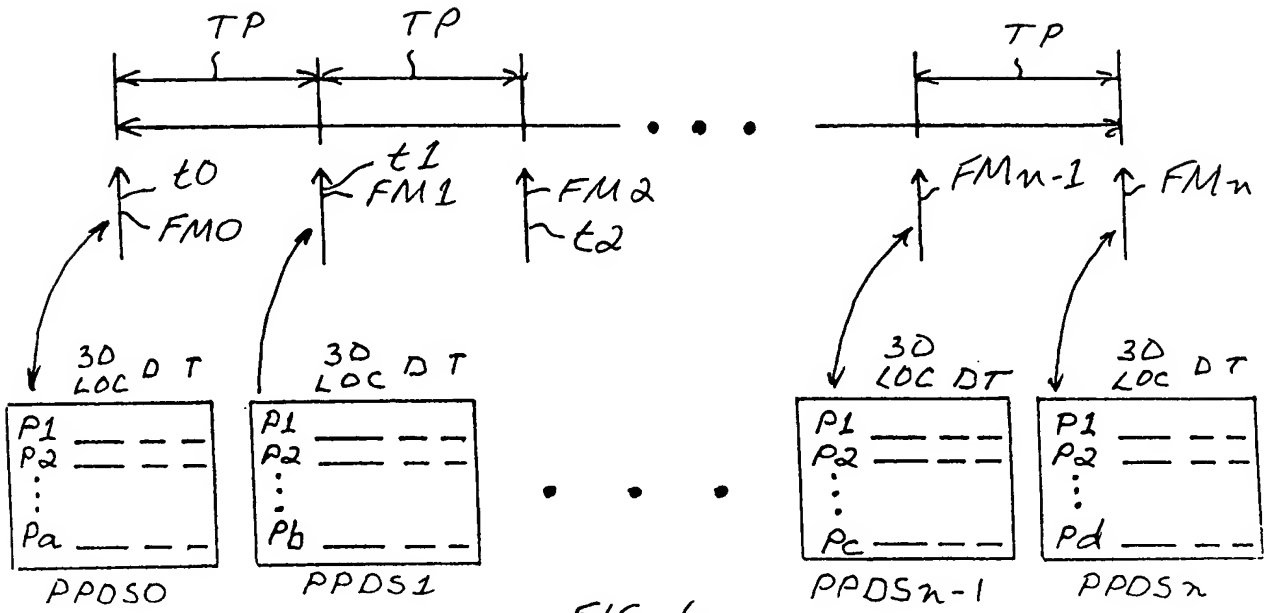
TP
TP
TP
t0
FM0
t1
FM1
FM2
t2
FMn-1
FMn
3D LOC DT
3D LOC DT
3D LOC DT
3D LOC DT
P1
P2
Pa
Pb
Pc
Pd
PPDS0
PPDS1
PPDSn-1
PPDSn

FIG. 6

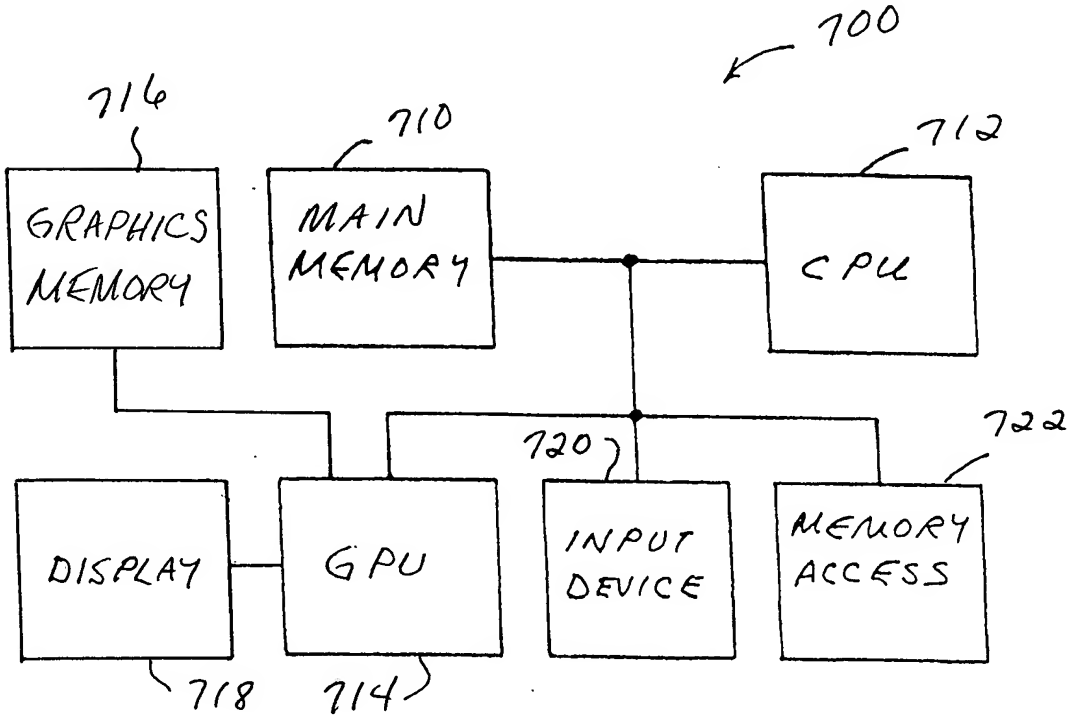
700
716
GRAPHICS MEMORY
710
MAIN MEMORY
712
CPU
720
722
DISPLAY
GPU
INPUT DEVICE
MEMORY ACCESS
718
714

FIG. 7